

Essential Cell Biology

PCB 3023 Class #24788 3 credits

Prerequisites: A grade of “C” or better in Integrated Principles of Biology I and II (BSC 2010, 2010L, 2011, 2011L)

Instructor: David Oppenheimer
Office: 115 Carr Hall
Email: oppenhe@ufl.edu

Class Schedule: Class # 24788 M, W, F | Period 3 (9:35 AM - 10:25 AM)

Class Location: McCarty Hall B (MCCB) 1108

Textbook: *Cell Biology* 3rd or 4th Edition
Thomas D. Pollard, MD, William C. Earnshaw, PHD, FRSE
and Jennifer Lippincott Schwartz, PHD
Publisher: Elsevier/Saunders

Course website: <https://elearning.ufl.edu/>

Class material including the syllabus, supplemental readings, and other information related to the course will be posted on the Canvas course.

Office hours: W & F 7th period (1:55 PM – 2:45 PM), or by appointment

Email: All email correspondence must be from your ufl.edu account, have your full name in the body of the email, and contain the course number (PCB 3023) in the subject line. Emails not meeting these requirements may not be recognized by my email filters and thus may not be answered promptly.

Course Objectives This course is an introduction to the basic concepts of molecular cell biology in prokaryotic and eukaryotic systems including experimental strategies and methodology. This course provides a strong foundation for Biology students, and is appropriate for anyone interested in the inner workings of cells. The lecture format will be used for this course, but students will be expected to participate in occasional class discussions. Lecture topics will include cell cycle regulation, the cytoskeleton and cell motility, cellular membrane systems, and the interaction of cells with each other and the environment. Grades will be assigned based on performance on four in-class Exams, plus performance on in-class (iClicker) quizzes. Exams will emphasize material covered in lecture, but questions may also cover material from the assigned reading in the text and supplemental information. Quizzes will cover information presented in the previous lecture and assigned reading for the current lecture.

An additional course goal is to develop critical thinking skills to enhance learning and assess information.

Class Attendance Students are expected to attend all classes and are responsible for all material covered during the lecture. Students are required to read the assigned chapters before coming to class. In class quizzes and problems will be based on the assigned reading.

Exams Exam Format

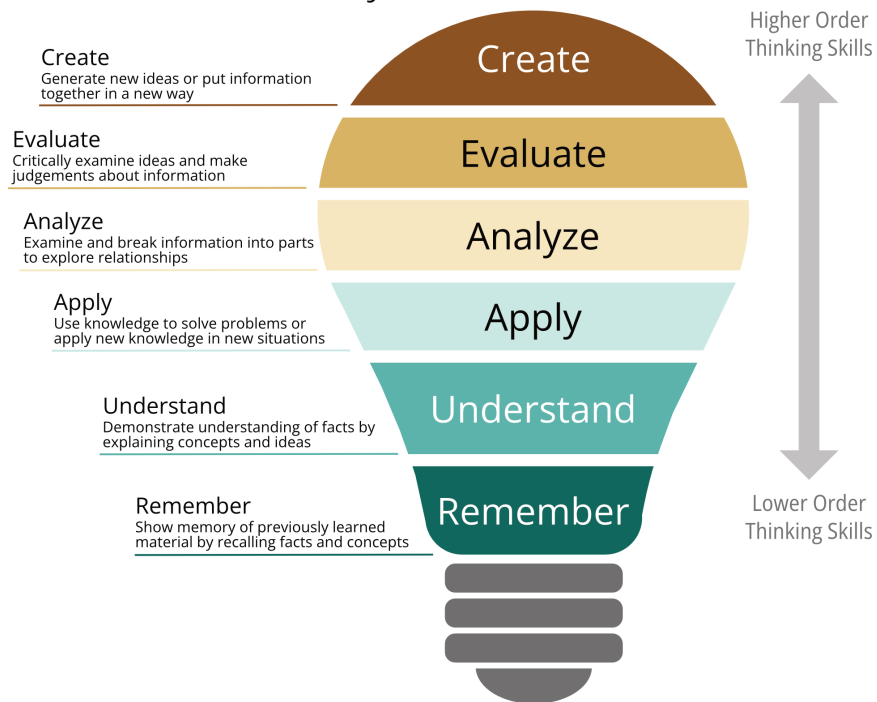
There will be 4 Exams during the semester. Exams will cover the material presented in lecture as well as any assigned supplemental reading or web-based material. Students will be responsible for assigned reading even if it is not specifically covered during the lecture period.

The exams will not be cumulative, however, concepts taught in this course build on each other. To do well on the exams you will need to remember and apply concepts covered in earlier units of this course.

Exams will be multiple-choice and machine graded. Answer sheets will be provided and must be filled in using a #2 or a softer pencil. All tests and answer sheets will be collected at the end of the exam period. No additional time will be given to complete an exam. (If you begin an exam late, then you will have less time to complete it.) Filling out the scantron sheet is considered part of the exam; do not expect extra time after the exam period has ended to fill out the scantron.

Question difficulty will include lower-level Bloom's Taxonomy questions, but students should also expect higher-level Bloom's Taxonomy questions. Students will be expected to analyze the concepts they are learning and apply knowledge to new situations. Bloom's Taxonomy levels are shown in the figure, below.

Bloom's Taxonomy



Additional Exam Information

Each student must bring their Gator ID to the exam. No student will be allowed to start an exam after the first student to complete an exam leaves the classroom.

Curves

See the Grading section.

Post-Exam Review

Exams will be available for review by appointment for one week following the posting of exam scores on Canvas. Exams will not be available for review after the semester has ended.

Make-up Exams

No make-up exams will be given without prior permission or documentation of illness. Students that will be missing an exam due to a pre-arranged university-approved excused absence (sports, etc.) should let the instructor know a minimum of two weeks in advance. In case of illness or personal emergency on exam day, students must submit documentation to the [Dean of Students office](#) and request an instructor notification to be sent. These notes must be received within five business days after the exam.

Quizzes

Quizzes will be given during lecture and will be counted as 20% of the course grade. The quizzes will cover the material presented during the previous lecture and the assigned reading for the current lecture.

The classroom response system used in this course is [iClicker](#). Visit the iClicker website (<https://www.iclicker.com/getting-started/>) to get started using iClicker. It is the student's responsibility to regularly check (i.e., daily or weekly) their iClicker sessions to ensure that their submissions were correctly synced to Canvas (eLearning), and to contact iClicker support to resolve any issues with submissions not being properly recorded in the gradebook.

iClicker Quiz Grading

The iClicker Quizzes are designed to be relatively low stakes to encourage participation. Each question posed will be scored as 0.6 LC points for a correct answer with an additional 0.4 LC points for participation. The iClicker quiz score is scaled to a max of 80%. What this means is that if you earn at least 80% of the total available LC points, you will receive 100% for the Quiz portion of your grade. If you earn less than 80% of the total quiz points, your score is scaled out of 80%, and you received that proportion of the quiz score. For example, if you earned 60% of the quiz points, your score in the Canvas gradebook would be $0.6/0.80 = 75\%$ of the total quiz points available. This scaling is done so that students do not need to worry about making up quizzes missed due to dead phone batteries, missing a lecture, etc.

Quiz Accommodations and Makeups

Accommodations for extended time on iClicker quizzes will not be needed. The questions are designed to be answered in 2-3 minutes, but will be available for 48 hrs.

Make-ups of iClicker quizzes will not be needed. The 80% = 100% grading scheme for the iClicker questions means that you can miss 20% of the quiz points (1/5 of the course) and still get full credit. The free 20% of the quiz points will be used for absences due to illness or other reasons. Missed quizzes due to long-term absences during the course will require a letter from the Dean of Students office, and the missed quizzes will be excused from grading.

Setting Up Your Account

Go to <https://www.iclicker.com/getting-started/> and click on the "I am a STUDENT" tab. **IMPORTANT: when creating your account, you must use your Gatorlink (@ufl.edu) email address. Failing to do so will result in receiving NO CREDIT for the quizzes.**

Join Code

Go to <https://join.iclicker.com/VJWL> to join the course, PCB3023 Essential Cell Biology.

Technical Support

For problems with iClicker, contact [iClicker Support](#).

Grading

Course grades will be determined by the scores of the 4 exams plus the quiz scores as follows: Each exam will be 20% of the total course grade (4 exams = 80%). The quiz scores will count as 20% of the course grade and will be added to the combined test scores (80% exam scores + 20% quiz scores = 100% course grade).

Exam Curves

A curve for each exam will be calculated as follows: The top three scores on each exam will be averaged, and the difference between that value and the maximum possible value of 100 points will be calculated. This curve point value will be added to each exam score. At the end of the semester, letter grades will be assigned based upon the percentage of total course points that you have earned during the semester, using the Grading Scale, below.

Table 1 Grading Scale

Point Range (%)	Letter Grade
≥ 90.00	A
≥ 86.66	A–
≥ 83.33	B+
≥ 80.00	B
≥ 76.66	B–
≥ 73.33	C+
≥ 70	C
≥ 66.66	C–
≥ 63.33	D+
≥ 60	D
≥ 56.66	D–
< 56.66	E

Grade Disputes

All grades will be posted on Canvas as course points. It is the responsibility of the student to check their grades on the iClicker and Canvas gradebooks. If there are missing grades or other problems, you must let me know within ONE week of the grade being posted on Canvas gradebook.

Grading Scale

Minimum grade cutoffs are listed in Table 1, above. Because each exam may be curved individually, the scores for the course as a whole will not be curved (i.e. these grade cutoffs will not be lowered). However, these cutoffs will not be raised; in other words, if you receive 90% of the possible points, you are guaranteed to earn an A grade. Final scores will NOT be rounded (i.e., 89.99% is not 90%).

Note that the current UF policy for assigning grade points is available at the following [undergraduate catalog web page](#).

Extra Credit

There are NO opportunities for extra credit in this course.

Special Treatment

Please do not request individual special treatment regarding grading at the end of the semester; **we do not adjust grades for individuals for any reason nor are grades “rounded up”**. Plan to do well on all exams and other assessments from the beginning of the semester; if you are having difficulty in the class, please let me know *before* the exams rather than after.

Academic Honesty

All students registered at the University of Florida have agreed to comply with the following statement:

“I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University.”

In addition, on all work submitted for credit the following pledge is either required or implied:

“On my honor I have neither given nor received unauthorized aid in doing this assignment.”

Any acts of cheating, plagiarism, or other forms of academic dishonesty will result in, at minimum, a 0 grade for the assignment, test, or quiz, and may include additional consequences up to and including a failing grade in the class.

Sharing information about tests and quizzes with students who have not yet taken the exam or quiz, or posting on social media information about tests and quizzes that other students have not yet taken, is a serious act of academic dishonesty. If you witness any instances of academic dishonesty in this class, please notify the instructor or contact the Student Conduct and Conflict Resolution office: visit <https://sccr.dso.ufl.edu/> or call 352-392-1261, or email sccr@ufsa.ufl.edu.

For additional information on Academic Honesty, please refer to the University of Florida Student Honor Code and Student Conduct Code at: [UF Student Honor and Conduct Code](#).

Time Commitment

The UF College of Liberal Arts and Sciences assumes that each student will devote 3-4 hours per week per credit-hour to each course, including time in lectures and labs. Because PCB 3023 is 3 credits, each student should therefore expect to devote 9-12 hours per week to this course during a regular semester. A recommended time allocation is below.

Activity	Hours per Week
Lectures	3
Textbook Readings	3–4
Review and Study	3–5

If you find yourself spending more than the recommended number of hours per week on average on these activities, discuss this with your course instructor to see if you can refine your study habits. We encourage you to view the Study Skill Videos (<https://writing.ufl.edu/writing-studio/video-resources/study-skills/> [Links to an external site.](#)). If you find yourself spending less than the recommended number of hours per week on average, you should recognize that you may have difficulty learning and comprehending the material in this time, and this will probably be reflected in poor

performance on the various assessments, causing you to receive a lower overall course grade.

Accommodations for Students with Disabilities

Students who will require a classroom accommodation for a disability must contact the Disability Resource Center, in 001 Reid Hall, 1316 Museum Rd, Gainesville, FL 32611 (phone: 352-392-8565). Please see the University of Florida Disability Resources website for more information at: <https://disability.ufl.edu/>. Note that the student should provide documentation of a requirement for accommodation **by the second week of classes**, or as soon as possible after any changes are made to their accommodations. No accommodations are available to students who lack this documentation. It is the policy of the University of Florida that the student, not the instructor, is responsible for arranging accommodations when needed. Once notification is complete, the Disability Resource Center will work with the instructor to accommodate the student.

Course Evaluations

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

Conduct in Class

Please be courteous and **do not talk during lecture**, as this can be distracting to the professor and the other students. Also, cell phones should be set to vibrate during lecture.

Students are expected to arrive to class on time and behave in a manner that is respectful to the instructor and to fellow students. Please avoid the use of cell phones except for answering quiz questions, and restrict eating to outside of the classroom. Opinions held by other students should be respected during in-class discussions, and do not hold conversations that do not contribute to the in-class discussion.

Students are encouraged to employ critical thinking and to rely on data and verifiable sources to interrogate all assigned readings and subject matter in this course as a way of determining whether they agree with their classmates and/or their instructor. No lesson is intended to espouse, promote, advance, inculcate, or compel a particular feeling, perception, viewpoint, or belief.

In-Class Recording

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form

part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

University Support Services

College can be a very stressful time in a person’s life. Resources are available on campus to help students meet academic goals and solve personal problems that may interfere with their academic performance. If you find that you are having difficulty emotionally or academically, there is substantial support available. See “[Finishing the Semester Strong](#)” or contact one of the following services:

- Health and Wellness
 - U Matter, We Care: If you or someone you know is in distress, please contact dsocares@ufsa.ufl.edu, or call 352-294-2273).
 - Visit <https://umatter.ufl.edu/> to refer or report a concern and a team member will reach out to the student in distress.
 - [Dean of Students Office](#), 202 Peabody Hall, 392-1261
 - Counseling and Wellness Center: Visit <https://counseling.ufl.edu/> or call 352-392-1575 for information on crisis services as well as non-crisis services.
 - Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit <https://shcc.ufl.edu/>.
 - University Police Department: Visit <https://police.ufl.edu/> or call 352-392-1111 (or 9-1-1 for emergencies).
 - UF Health Shands Emergency Room/Trauma Center: If you have an emergency, please call 911, consult your doctor or go directly to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; <https://ufhealth.org/locations/uf-health-shands-emergency-room-trauma-center>.
 - If you are experiencing food insecurity, please visit [The Hitchcock Field and Fork Pantry](#), 564 Newell Dr, Gainesville, FL 32603, 352-294-3601
- Academic and Student Support
 - Career Connections Center: 352-392-1601. Career assistance and counseling services <https://career.ufl.edu/> email: UFCareerCenter@ufsa.ufl.edu

- Library Support: Various ways to receive assistance with respect to using the libraries or finding resources: <https://cms.uflib.ufl.edu/ask>
- Teaching Center: 352-392-2010 General study skills and tutoring: <https://academicresources.clas.ufl.edu/>
- Writing Studio: 352-846-1138. Help brainstorming, formatting, and writing papers: <https://writing.ufl.edu/writing-studio/>
- CLAS Academic Advising Center, Farrior Hall, 100 Fletcher Drive, 392-1521

We are commitment to promoting diversity and inclusion based on sex, including sexual orientation and gender identity. For Title IX issues, please visit <https://titleix.ufl.edu/> or contact the UF Title IX office at (352) 273-1094 or inform@titleix.ufl.edu.

Lecture Schedule

Lecture topics for this course are listed below. This is a flexible, tentative schedule; the dates and amount of coverage of specific topics may vary somewhat from the list below.

Date		Topic	Chapter
		Introduction to Cell Biology	
Mon 1/13	1	Introduction to course	
Wed 1/15	2	Proteins	3
Fri 1/17	3	Biophysical Principles	4
Mon 1/20		Holiday, No Classes	
Wed 1/22	4	Macromolecular Assembly	5
Fri 1/24	5	Research Strategies	6
Mon 1/27	6	Membrane structure and dynamics	13
Wed 1/29	7	Membrane pumps	14
Fri 1/31	8	Membrane carriers	15
Mon 2/3	9	Membrane channels	16
Wed 2/5	10	Cystic Fibrosis Transmembrane Regulator	See course resources
Fri 2/7	11	Membrane physiology	17
Mon 2/10	12	EXAM 1	
Wed 2/12	13	Post-translational targeting of proteins	18
Fri 2/14	14	Endoplasmic Reticulum	20
Mon 2/17	15	Secretory Membrane System and Golgi Apparatus	21
Wed 2/19	16	Endocytosis and the Endosomal Membrane	22
Fri 2/21	17	Plasma Membrane Receptors	24
Mon 2/24	18	Protein hardware for signaling	25
Wed 2/26	19	Second Messengers	26
Fri 2/28	20	Integration of Signals	27
Mon 3/3	21	Extracellular Matrix Molecules	29
Wed 3/5	22	Intercellular Junctions	31
Fri 3/7	23	EXAM 2	
Mon 3/10	24	Introduction to the cytoskeleton	
Wed 3/12	25	Actin and Actin-Binding Proteins 1	33
Fri 3/14	26	Actin and Actin-Binding Proteins 2	33
Mon 3/17		SPRING BREAK	
Wed 3/19		SPRING BREAK	

Fri 3/21		SPRING BREAK	
Mon 3/24	27	Microtubules and Centrosomes	34
Wed 3/26	28	Intermediate Filaments	35
Fri 3/28	29	Cellular Motility	38
Mon 3/31	30	Intracellular Motility	37
Wed 4/2	31	Muscles	39
Fri 4/4	32	EXAM 3	
Mon 4/7	33	Introduction to the Cell Cycle	40
Wed 4/9	34	Cell cycle and cancer	
Fri 4/11	35	G ₁ Phase and Regulation of Cell Proliferation	41
Mon 4/14	36	S Phase and DNA Replication	42
Wed 4/16	37	G ₂ Phase and Control of Entry into Mitosis	43
Fri 4/18	38	Mitosis and Cytokinesis	44
Mon 4/21	39	Programmed Cell Death	46
Wed 4/23	40	EXAM 4	